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ABSTRACT

Since 1978, the Education Commission of the States has worked closely with the U.S. Department of Energy to: collect/disseminate information regarding federal, state, and local energy education/conservation activities; assist states in developing/implementing both energy education and school energy management policies and programs; and better prepare state education officials to deal effectively with energy supply disruptions and/or significant price escalations. Rather than list and evaluate completed activities, this final report focuses on the current status of energy as a topic of public interest and of educational interest in the states. A general portrayal of state-level involvement in energy education, state-specific characteristics of the seven pilot states which have worked most closely with the project (Colorado, Florida, Idaho, Illinois, Massachusetts, Nebraska, and Ohio), and a few comments regarding inter-regional differences in the way states have dealt with energy education are included. conclusions reported are those indicating: cuts in most state energy education programs; existence of state energy offices in all states but under a variety of administrative arrangements; and infusion of energy topics by energy education advocates into basic subject areas. (JN)

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ENERGY EDUCATION AS WE LEAVE IT

FINAL REPORT

ECS State Energy and Education Project

Education Commission of the States

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October 31, 1983

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INTRODUCTION

Since 1978, the Education Commission of the States has worked closely with the U.S. Department of Energy to do the following: 1) collect and disseminate information regarding federal, state and local energy education and conservation activities; 2) assist states in developing and implementing both energy education and school energy management policies and programs; 3) better prepare state education officials to deal effectively with energy supply disruptions and/or significant price escalations.

Over the years, the project has developed and maintained an extensive resource center of publications related to energy education and conservation from the public and private sectors and a data bank that includes contact names, program descriptions and product listings from state energy offices and education agencies. Perhaps most important, however, the project has earned a national reputation as an objective source of current information regarding energy education, energy management and energy emergency planning nationwide. In this capacity, project staff have convened important conferences which have influenced the subsequent direction of energy education and energy planning in the states; written and distributed a variety of publications to literally thousands of educators and political officials; played a leading role in virtually every national, regional and state conference related to the scope of the project; acted as spokespersons for the states in the national arena; and provided guidance to other

national energy education projects.

In spite of these accomplishments, the project is scheduled to end on October 31, 1983. Rather than list and evaluate completed activities, which have been the subject of monthly progress reports, this final report instead focuses on the current status of energy both as a topic of public interest and as a topic of educational interest in the states. The latter section includes a general portrayal of state-level involvement in energy education, state-specific characteristics of the seven pilot states which have worked most closely with the project, and a few comments regarding inter-regional differences in the way the states have dealt with energy education.

ENERGY AS A TOPIC OF PUBLIC INTEREST

Ten years ago, almost to the day, the United States was the target of an Arab oil embargo, primarily imposed in retaliation for U.S. support of Israel. Shock and anger were quickly followed by the development of state and federal programs designed to lessen our dependence upon foreign oil by 1) stimulating domestic production of oil and alternative energy sources and 2) promoting conservation. Although public concern over energy as a policy issue had waned by the mid-seventies, the 1979 Iranian crisis once again sent oil prices skyrocketing and rekindled our national interest in energy independence.

A decade after the 1973 oil crisis, the American public again seems to have become complacent over oil prices and availability and, for the most part, seems to be going along with the

Administration's plans for oil and gas deregulation. Yet, a closer examination of our energy consumption patterns and attitudes reveals that some rather profound changes have occurred since 1973. Prior to the Arab oil embargo, gasoline sold for approximately $.38 per gallon; today its average price is $1.20 per gallon, slightly down from previous highs. As a result, we use less of this more precious commodity; 1984 cars are twice as energy efficient as were 1974 cars, getting an average of 26 miles per gallon rather than 13. We also may have learned to be uneasy over the nation's dependence on foreign oil and have decreased the relative extent of that dependence. We know that a third crisis could easily occur, particularly as the war between Iran Iraq continues.

The public's pervasive and enduring interest in energy conservation and its uneasiness over our continued reliance on the volatile Middle East for a significant portion of our oil (albeit down from almost half to approximately one-third) suggest that energy education has occurred since 1973. The extent to which this has resulted from public information programs, the media, common sense reactions to higher prices or formal educational programs may not matter insofar as all four factors have been mutually reinforcing. And, as a result of unlimited energy at relatively low prices no longer being available, people have become conscious of energy as an important topic, basic to making realistic decisions about personal consumption and to making wise public policies about social and economic, domestic and international matters.

ENERGY AS A TOPIC OF STATE EDUCATIONAL INTEREST

Energy education is no longer a priority, and this fact is reflected in the relative lack of direct attention it receives at the state level. Its diminished stature is a natural consequence of energy not being in the center of a world economic or political crisis at a time when federal, state and local governments are slashing expenditures in virtually all budget categories, including energy and education. The importance that might ordinarily be attached to energy education is overshadowed by the pervasive public outrage over other, more general, issues of educational quality. And, according to economic theory, the allocation of scarce public resources reflects relative public urgencies.

Since most energy educators have advocated for the infusion of energy concepts into the core curriculum rather than for the creation of separate energy courses, the current downgrading of energy education may be more apparent than real, more a matter of losing visibility than losing academic coverage. For example, the American Chemical Society's new high school chemistry curriculum addresses several energy concepts as part of an effort to relate chemistry to pressing social issues. The extent to which this pattern is followed in other subject areas and grade levels will determine whether or not energy educators have succeeded in their efforts to "energize" the curriculum.

Certainly the comments made by energy educators at the March 1, 1983 Invitational Seminar, convened by the ECS Energy and

Education Project, indicate a commitment to broader educational improvement efforts and a willingness to lose one's energy-specific identify in exchange for being part of the general educational reform movement. Since most energy educators have come from science, social studies, or other academic disciplines, turf is hardly an issue. Instead, concerned educators seem to be motivated by their desire to create better programs in what are generally recognized as core subject areas that reach large numbers of students.

Although the extent to which energy education has penetrated the elementary/secondary curriculum is ultimately the result of the interest and initiative of individual classroom teachers, project staff are somewhat optimistic in their sense that, through the work of the ECS State Energy and Education Project and other energy and education-related projects, energy education has become "institutionalized." (Results from a 1982 survey by the National Science Teachers Association support this conclusion.) Yet, in spite of our observations suggesting that energy concepts and issues have entered the educational mainstream during the past decade, we cannot ignore the possibility that these inroads may not be sustainable due to the decreasing public resources being devoted to the topic. Findings from an informal, 50-state telephone survey indicate the severity of state agency cutbacks in personnel and programs. Three of the state education agency trends noted by Dr. Petrock in her December 1982 article, "The Status of Energy Education in the States," are still valid:

1. Energy education specialist positions, which were commonly established during the seventies, often have been eliminated and the associated responsibilities assigned to curriculum specialists in science and/or social studies. In those states where energy education has always been one of the many responsibilities of a curriculum specialist, the amount of time such persons devote to the energy aspect of their work has decreased.

2. Fewer new materials are being produced; instead, there is a tendency to revise and repackage materials produced several years go.

3. Some states have virtually eliminated the energy education responsibilities within the state education agency and instead are assuming that energy education is a local school district responsibility.

Similarity, most of the patterns attributed to state energy offices are still valid:

1. In many states the energy office is no longer an independent agency; instead, it has become a division within another department, such as regulatory agencies or natural resources.

2. With respect to budgets, most state energy offices have already felt the impact of decreased federal funding . . . and have pared down staff and programs accordingly. This is particularly true in those states where the energy office has relied almost entirely on federal funds. . . .

3. State energy offices have tended to retain some public information programs supported through the Energy Extension Service and other federally funded, state-administered conservation programs . . . (Most other state energy office activities related to the elementary/secondary school curriculum have been eliminated.)

4. The combination of . . . cutbacks in federal funding and the current uncertainty over future funding for state energy offices has been responsible for personnel changes within virtually every state energy office. As is the case within state education agencies, many offices have eliminated their education specialists; others have retained these positions, generally within the Energy Extension Service structure. Regardless of the specific programmatic assignments, there has been considerable turnover among those individuals responsible for energy education and/or public information programs. This, in turn, has led to problems of unintentional overlapping and/or overlooked activities within and among states until staff have become familiar with their new responsibilities.

In addition to the impact of tighter budgets for energy and education programs at all levels of government, project staff observe a second major factor that may ultimately work to the detriment of comprehensive, objective energy education programs, i.e. the transition from public sector to private sector involvement. Many, if not all, of the continuing energy education programs are industry-supported and/or industry-based. For example, Energy 83, Energy and Man's Environment, Energy Source and American Energy Week are all primarily sponsored by the private sector, usually through the public utility companies. Although the oil companies are engaged in fewer educational efforts because of tighter finances, nevertheless, some companies continue to sponsor curricular activities, as do some of the gas companies. The industry associations employ education specialists who disseminate materials to educators that obviously reflect well upon their members' vested interests. In addition to the question

of objectivity in such materials and/or programs, a second problem may be developing, one which has received relatively little attention. How can a typical teacher-- within the normal and reasonable parameters imposed by limited time for subject research and curriculum development-- create a comprehensive, balanced program from the plethora of separate, specialized materials he or she may find, most of which are produced by oil, gas or utility interests?

ENERGY EDUCATION IN THE SEVEN PILOT STATES

Colorado

Colorado has no position specifically defined for energy education in either the state energy office (SEO) or state education office (SEA). The SEO continues to exist without state financial support and is primarily involved in the Institutional Conservation Program (ICP) and Energy Extension Service (EES) programs around the state. There has been no identifiable energy education program in Colorado for five years, and most of the curriculum materials produced in Colorado are now out of print. The SEO has repeatedly attempted to obtain statutory authority to exist as a state agency (thereby becoming authorized to receive state funding through state appropriations) but has not succeeded. The SEO operates under the Colorado Department of Regulatory Agencies, but still exists under executive order of the governor.

The local EES offices are active in promoting both energy education and energy management for schools, businesses and residences. The SEO will refer calls to local EES centers, which

have extensive libraries and experienced staff. In 1979-1980, Colorado was active in energy emergency planning, although emergency plans were limited to petroleum-based energy sources. The governor's emergency powers have been eliminated by the legislature since the development of the state plan.

The SEA has no involvement in energy education, except for whatever may be discussed or considered by Field Coordinators or the Environmental Education Coordinator. Colorado has an Energy and Man's Environment Program, which is active in organizing teacher inservice workshops, supported largely by the Public Service Company of Colorado.

Florida

Mr. C. Richard Tillis, Director of the Office of Energy and Environmental Education in the Florida Department of Education, is responsible for energy education in both the SEA and SEO. The SEO refers any calls on energy education to Mr. Tillis and has given him all the curricular materials developed over the years through joint projects between those two offices. (The Florida curriculum materials have been added to the ERIC system.) The SEA continues to receive state funding for energy-related activities, and, as a result, Florida's large school districts are still active in energy education, sometimes through mini-grants from the SEA. These large local districts, e.g., Broward County, Seminole County, and Dade County, have also gained notoriety in their energy emergency planning reports and continue to be active and

concerned with this topic.

Power Company has been supportive of both energy education and energy management in the schools, primarily through in-kind services and their own public relations programs.

Idaho

Idaho's involvement in energy education and school energy management was initially comparable to states such as Florida or Nebraska, but has diminished in the last several years. Idaho is fortunate in having low cost hydropower for electrical generation and, due to a low population and considerable oil and gas reserves in-state and in neighboring states (which also have refinery capacity), Idaho has not been particularly concerned with energy emergencies.

The SEA has undergone major staff reductions and budget cuts. However, Mr. Dick Kay, the Science Coordinator, continues to be a spokesman for energy education, while also having responsibility for several other special topics. Dr. Wayne Phillips handles energy conservation for school facilities and transportation systems for the SEA, and has described Idaho's interest in developing geothermal resources. (A geothermal spring within Boise is being commercially developed and has drawn considerable national attention.) Idaho is active in EME and has a state coordinator, who has involved private sector energy companies in supporting EME programs. The SEO is under the division of water resources. Through the EES program, some energy education is occurring in local districts and community energy programs.

Illinois

The Illinois SEA has also experienced major budget cuts and loss of staff. However, workshops emphasizing solar energy applications for schools and residences are still sponsored by the SEA for vocational educators and science teachers. The SEA has not produced energy-related curricular materials, but does refer teachers to materials produced by other states or national organizations. Many local school districts support energy conservation in driver education programs.

The SEO exists under the auspices of the State Department of Natural Resources. Illinois has an energy management program for schools in conjunction with the ICP program. Several energy companies, primarily coal companies and nuclear-energy supplied utilities, have energy education-public information programs.

Massachusetts

The SEA has no staff person specifically responsible for energy education, but it does have an energy management specialist. The SEA has gone through several reorganizations and changes in leadership, making it difficult to obtain information or assistance.

The SEO has a series of reports on energy conservation and several programs of an energy education nature. For example, The "Energy Phone" is a toll-free hot line that provides answers to energy conservation questions and referrals to publications. The SEO has recently published a consumer-oriented "Here Comes the Sun" book on solar retro-fits. The Massachusetts Audubon Society

has published reports on several energy related topics, including how to improve oil and gas heating systems. Several other locally-based organizations, school districts and collaboratives are involved in energy education and energy management, underscoring the continued importance of energy conservation in the oil dependent northeast.

Massachusetts may be a useful example of a state that is having fiscal problems and is not active through state-level mechanisms, while local organizations reflect the interests and concerns of the state's residents.

Nebraska

Nebraska has been one of the most active states in energy education. The SEO assumes a leadership role by 1) working closely with several other state agencies to produce and update curricular materials at the elementary through adult education levels; 2) presenting workshops on a variety of energy and education topics through the state's community colleges; 3) producing public television spots on conservation and renewable energy applications; and 4) developing an awareness of energy conservation in transportation, through driver education, car-pooling, and school bus operations.

Through an increase in the state severance tax on oil and gas, the state legistature has appropriated funds to the SEO for several programs that contain an energy education component. A state-wide weatherization program offers assistance for school districts to improve the energy efficiency of facilities. Summer

teacher training programs are offered across the state, as are free subscriptions to an energy newsletter.

There are other energy education programs at the state and local levels. Nebraska has not changed its sincere commitment to energy education, but instead has refined programs to reflect curricular reform in that state.

Ohio

Ohio's Office of Energy Assistance, located in the Department of Education, has been diminished considerably, due to state fiscal problems. However, the office continues to answer questions and mail energy-related publications.

The SEO is no longer a cabinet-level agency; instead, it is an operative of the Department of Development. The SEO relies on federal funds for continued existence and is chiefly involved in ICP and EES activities. The SEO and SEA are attempting to gain corporate support from energy companies to continue energy fairs and energy expositions in local school districts. Training sessions for school building operators are continuing through support from the SEO. The SEO has been attempting to promote a low interest loan program with private sector lenders. The agency continues to disseminate energy education materials produced by the U.S. Department of Energy, the National Science Teachers Association and the Education Commission of the States while supplies last and encourages local schools and agencies to initiate local efforts.

ENERGY EDUCATION IN THE REGIONS

Northeast

Northeastern states continue to pay a high price for heating oil and are still reliant on liquid fuels as their primary energy source. Conservation programs, particularly low cost weatherization, are being supported by public/private sector parternerships. Solar energy programs are also gaining popularity and are sponsored and encouraged by local community organizations. The Audubon Societies in both Maine and Massachusetts are good examples of supportive organizations, as opposed to state education agencies which, due to fiscal problems and the current emphasis on more broadly-defined, education improvement efforts, are not active in energy education as a curricular topic. The state energy offices continue to exist and administer the ICP and EES programs, as well as low-income energy assistance and weatherization activities. EES coordinators are providing more energy education assistance to teachers than is generally realized. Nuclear energy is a highly controversial topic in the northeast, and there is extensive literature and classroom teaching materials on nuclear energy and on acid rain.

Southeast

The Southeast is characterized by its reliance on imported liquid fuels and its very costly electricity, due to high generation costs. States in the region tend to have very large, usually nuclear-supplied, utilities, which provide energy education on their own or through sponsorship of EME and/or other

commercial energy education programs.

North Carolina is very active in energy education through energy management and has created a unique Alternative Energy Corporation. Local organizations, including labor unions from coal companies and manufacturing plants, promote energy conservation through low cost weatherization, in some cases for the purpose of helping layed-off employees cope with high heating and cooling costs.

Southwest

Southwestern states have been active in developing alternative energy sources. For example, Arizona has used federal grants from several different departments, such as Housing and Urban Development and Interior, to develop solar applications. Most state energy offices have well-established EES programs some have been directly involved in energy education curriculum development, while others support outside curricular efforts. (For example, Arizona has developed materials, which Texas has supported EME at the local district level.) Many of the energy producing companies in the region have also played a role in developing and/or supporting energy programs at local school districts and institutes of higher education.

Northwest

There is considerable debate over energy topics in this region. For example, controversy surrounding the discontinued nuclear power plants in Washington has polarized the utility companies and consumers, and consumer groups have formed to battle

rate increases. The SEAs and SEOs are generally not involved in the controversy. Conservation and weatherization programs are even somewhat controversial in several states because of existing and/or proposed weatherization mandates.

Rocky Mountain Region

A majority of these states have EME programs with state coordinators. EME continues to provide an impressive array of teacher inservice programs and curricular materials. Wyoming's energy education network is working well, with an emphasis on science teachers. School energy management does not seem to be very important in the Rocky Mountain region. Whether this is due to the lessening emphasis on energy at the national level or to competing issues in the education arena is difficult to determine. SEOs continue to administer the ICP and EES programs, but no governor nor legislature has taken major action to promote energy-related programs. As in other parts of the nation, Rocky Mountain states appear to have spent oil overcharge monies on low income energy assistance programs. Utah has a state-supported school weatherization program, similar to Nebraska's. Montana is active in local EES programs that tend to focus on energy education for adult audiences.

Midwest

Nebraska and Iowa are standouts in energy education. The Midwest Energy Education Consortium continues to exist and stimulate interstate and interagency coordination and cooperation. Energy programs often occur as subunits of agricultural education

and agricultural-related vocational education. programs. Many of these states' driver education programs emphasize energy conservation, and there are several computerized school bus routing programs. SEO reorganizations have occurred in many midwestern states, and SEAs have been hurt by fiscal problems, which translates into SEA staff handling several curricular topics.

CONCLUSIONS

Due to severe fiscal crises in the states during the last few years, most SEAs have cut back on energy education programs and no longer have staff specifically assigned to handle energy-related topics. Instructional materials are sometimes available upon request, but teacher inservice training programs have often been eliminated.

Schools continue to face rising energy costs, and some SEAs provide technical assistance to local districts through field coordinators and through transportation and facility management specialists. A small percentage of schools in all the states have received federal support in the form of matching grants for facility energy conservation through the Department of Energy's ICP program.

Although federal funding for energy programs has decreased in the last several years, SEOs continue to exist in all the states, but under a variety of administrative arrangements. Many SEOs received program-specific funding from oil overcharge refunds to the Department of Energy from several large oil companies. Some

SEOs receive partial funding from state revenues, and most receive a large contribution of "in-kind" support from private sector energy-related companies. SEOs continue to be indirectly involved in energy education through public information programs that stress conservation. However, few SEOs have staff or financial support similar to the levels that characterized the 1970's.

In spite of financial and staff cutbacks in virtually every state education agency and state energy office, energy education advocates have made progress in institutionalizing energy education through the infusion of energy topics into basic subject areas. However, the combination of public complacency over energy as a topic of concern and dwindling federal, state and local revenues devoted to promoting energy literacy raises the question of whether the progress made over the past decade can be sustained. The continuing involvement of the private sector raises additional questions regarding both the objectivity and the comprehensiveness of current and future energy education programs.

Under such circumstances, it is regrettable that a principal source, nationwide, of comprehensive, objective information regarding energy education at all grade levels, as well as school energy management and emergency planning is closing its doors. Not only has the ECS State Energy and Education Project served as an information clearinghouse, but it has also been an impartial arbitrator of controversial issues, a focal point for national leadership in the development and implementation of cost-effective energy education programs, a catalyst for state and local actions, and a conduit to state education policy makers during an era of

education reform.

Because the project is ending when federal support for energy education and for a myriad of other state-administered programs is so low, project staff feel compelled to express their concern for the security of the nation when the next energy emergency arises. For, in spite of the ten years we have had to prepare, the nation is still vulnerable to sudden energy supply disruptions. And, in spite of a federal commitment to develop appropriate energy policies and related public education programs, the adequacy of current policies and the extent of current educational efforts force us to ask not only about the nature of the federal commitment, but about the potential economic and political dangers that we face.